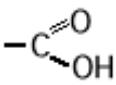
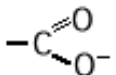

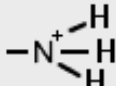



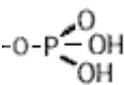
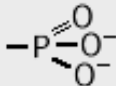


POLAR OR NON-POLAR PROPERTIES OF SOME FUNCTIONAL GROUPS

Group	Name	Properties	
-OH	Hydroxyl, or alcohol	Polar (soluble, because it is able to form hydrogen bonds)	see note 1
	Carboxyl	Polar (soluble); often loses its hydrogen, becoming negatively charged (an acid): 	see note 3
	Amino	Polar (soluble); often gains a hydrogen, becoming positively charged (a base): 	
	Aldehyde	Polar (soluble)	} carbonyl see note 2
	Ketone	Polar (soluble)	
	Methyl	Hydrophobic (insoluble); least reactive of the side groups	
	Phosphate	Polar (soluble); usually loses its hydrogens, becoming negatively charged (an acid): 	

Notes

1. Polar can be used in 2 senses.

=(1.) Sometimes polar is used as the opposite of nonpolar, as a synonym for water soluble or hydrophilic. In this case polar includes both neutral and charged groups that are water soluble. In the chart shown above, polar is used in this sense. =(2.) Sometimes polar is used in contrast to charged, to mean molecules or groups that are neutral overall but have regions that are partially plus or minus. This is what is meant by neutral - polar or uncharged - polar. (For examples of this usage, see charts of the amino acids in either of your texts.)

2. Carbonyl is a general term for anything with the formula $\text{--}\overset{\text{O}}{\parallel}{\text{C}}\text{--}$ whether aldehyde or ketone.

3. A carboxyl does *not* have the same properties as a carbonyl plus a hydroxyl. The H in a carboxyl usually ionizes and the H in a hydroxyl usually does not. In other words, a carboxyl is not considered equivalent to a hydroxyl plus a ketone -- a carboxyl is a new chemical group and the properties of the whole are different from the properties of the individual parts.